

Customer No.: 31561
Application No.: 10/707,084
Docket No.: 10722-US-PA

REMARKS

Present Status of the Application

In the Office Action, claims 1-21 are rejected. Specifically, claims 1-5, 10-12, 14-17 and 21 are rejected under 35 USC §103(a) as being unpatentable over Onishi (U.S. Application No. 2003/0146444) in view of Ando (U.S. Patent No. 6,429,467) further in view of Ishikawa et al. (U.S. Patent No. 5,977,565) further in view of Parikh et al. (2003/0015708). In addition, claims 6-9, 13 and 18-20 are allowable if written in independent form including all of the limitations of the base claim and any intervening claims. Applicants would like to thank the Examiner for the allowance of claims 6-9, 13 and 18-20. Reconsideration and allowance of those claims is respectfully requested.

Response to Claims Rejections under 35 USC§103

Claims 1-5, 10-12, 14-18 and 21 are rejected under 35 USC §103(a) as being unpatentable over Onishi in view of Ando, Ishikawa and Parikh.

For a proper rejection of a claim under 35 U.S.C. section 103, **the cited combination of references must disclose, teach or suggest all elements/features/steps of the claim.**

Independent claims 1 and 11 states:

Claim 1. An UV photodetector, comprising:

a substrate;

a GaN-based semiconductor layer, disposed on the substrate, wherein the GaN-based semiconductor layer comprises a first protrusion portion;

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a high-resistivity GaN-based interlayer, disposed on the first protrusion portion of the GaN-based semiconductor layer, and a material of the GaN-based interlayer comprising $\text{Al}_x\text{In}_y\text{Ga}_{1-x-y}\text{N}$, wherein $x \geq 0$, $y \geq 0$, $1 \geq x + y$;

a first electrode, disposed on the GaN-based interlayer; and

a second electrode disposed on a portion of the GaN-based semiconductor layer except for the first protrusion portion.

Claim 11. An UV photodetector, comprising:

a substrate;

a GaN-based semiconductor layer, disposed on the substrate;

a high-resistivity GaN-based interlayer, disposed on the GaN-based semiconductor layer, and a material of the GaN-based interlayer comprises $\text{Al}_x\text{In}_y\text{Ga}_{1-x-y}\text{N}$, wherein $x \geq 0$, $y \geq 0$, $1 \geq x + y$; and

a patterned electrode layer disposed on the GaN-based interlayer.

Independent claims 1 and 11 are allowable for at least the following reasons.

(1) Onishi, Ando and Ishikawa do not disclose, teach or suggest "UV detector" as disclosed in claims 1 and 11 of the application. The whole patent of Ando disclosed a field effect transistor (FET). FIG. 19 of Onishi, as recited in the Office Action, discloses a semiconductor laser device (referring to [0330] and [0331] of Onishi). The whole patent of Ishikawa, and FIG. 5 thereof as recited in the Office Action, discloses a light emitting diode (LED). It is obvious that the laser device of Onishi and the LED of Ishikawa are light emitting devices for providing light, but not light (UV) detecting device (detector) for measuring the light intensity, in addition, Ishikawa does not disclose that the FET can be a UV detector. In fact, the FET is NOT equivalent to the UV detector for a skilled artisan because the function of the FET and that of the UV detector is quite different. Accordingly, Onishi, Ando and Ishikawa are not analogous to claims 1 and 11 of the application.

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(2) Examiner asserts that, in the semiconductor laser device discussed by Onishi (FIG. 9), a substrate (121), a first GaN-based semiconductor layer with striped shaped protrusion, a GaN-based buffer layer (137), first contact layer (128) and second contact layer (131) are disclosed. However, from the Office Action, Applicant can not find the numerals in FIG. 9 that are corresponding to "first GaN-based semiconductor layer" and "striped shaped protrusion". Additionally, the second contact layer (131) is formed on the first contact layer (128), i.e. the second contact layer (131) and the first contact layer (128) disclosed by Onishi (FIG. 9) are electrically coupled to each other. Therefore, Applicant considers that the first contact layer (128) and the second contact layer (131) are NOT equivalent to the first electrode and the second electrode recited in Claim 1 because the first electrode is NOT formed on the second electrode.

From the disclosure of the Onishi, Applicant asserts that Onishi ont only fails to disclose "GaN-based interlayer comprising $Al_xIn_yGa_{1-x-y}N$ ", but also fails to disclose "the first electrode" and "the second electrode" of claims 1 and 11. Further, Onishi still fails to disclosed the relative position of the first electrode and the second electrode written in Claims 1 and 11.

(3) Ando discloses a FET requiring a gate 19, a source 17S and a drain 17D (as shown in FIG. 2A of Ando). However, the structure of Onishi (as shown in FIG. 19) or that of Ishikawa (as shown in FIG. 5) does not need/have gate and source/drain. Therefore, the structure of Ando is different from and can't be adapted for that of Onishi and Ishikawa. Accordingly, there is no motivation and teaching for combining Ando with Onishi and Ishikawa. In addition,

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claims 1 and 11 of the application do not need/have gate and source/drain, and thus is different from Ando.

(4) Onishi and Ishikawa do not disclose, teach or suggest "GaN-based interlayer comprising $\text{Al}_x\text{In}_y\text{Ga}_{1-x-y}\text{N}$ " of claims 1 and 11. Furthermore, Onishi does not disclose, teach or suggest any "GaN-based layer" such as "GaN-based semiconductor layer" and "GaN-based interlayer", and the electrodes of claims 1 and 11.

(5) Applicant asserts that if we try to combine the technologies disclosed by Onishi, Ando, Ishikawa and Parikh, we must combine some elements of a semiconductor laser device, some elements of a field effect transistor (FET) and some elements of a light emitting device (LED) first, and then suppose the result of the combination can be adopted to and compatible with a UV detector disclosed by Parikh. Since the semiconductor laser device, the FET and the LED are optical devices with different properties; Applicant asserts that a skilled artisan can NOT predict the combination of the semiconductor laser device, the FET and the LED must be a UV detector.

Thus, Onishi, Ando, Ishikawa and Parikh do not make claims 1 and 11 obvious. The withdrawal of the rejection and the allowance of claims 1 and 11 are therefore earnestly solicited.

If independent claims 1 and 11 are allowable over the prior art of record, then its dependent claims 2-10 and 12-21 are allowable as a matter of law, because these dependent claims contain all features/elements/steps of its respective independent claims 1 and 11.

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CONCLUSION

For at least the foregoing reasons, it is believed that all pending claims 1-21 are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

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Respectfully submitted,

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